Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH)

Sulfur

Version number: GHS 1.3 Date of compilation: 17.02.2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance	**Sulfur**
Registration number (REACH)	01-2119487295-27-xxxx
EC number	231-722-6
CAS number	7704-34-9
Alternative name(s)	Sulfur
Product number	RDG-7801

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Use as an intermediate Rubber production and processing

1.3 Details of the supplier of the safety data sheet

Rosneft Deutschland GmbH
Behrenstr. 18
10117 Berlin
Germany

Telephone: +49 30 70014 2597
e-mail: hseq@rosneft.de
Website: www.rosneft.de

e-mail (competent person)	hseq@rosneft.de

1.4 Emergency telephone number

Poison centre

Country	Name	Telephone	Opening hours
Germany	Giftnotruf München	0049 - 89 -19240	Mon - Fri 00:00 - 23:59

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Section	Hazard class	Category	Hazard class and category	Hazard statement
3.2	skin corrosion/irritation	2	Skin Irrit. 2	H315

For full text of abbreviations: see SECTION 16.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

- Signal word warning
- Pictograms

GHS07

- Hazard statements

H315	Causes skin irritation.

- Precautionary statements

P101	If medical advice is needed, have product container or label at hand.
P102	Keep out of reach of children.
P103	Read carefully and follow all instructions.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P302+P352	IF ON SKIN: Wash with plenty of water.
P321	Specific treatment (see on this label).
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362+P364	Take off contaminated clothing and wash it before reuse.

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	sulfur
Identifiers	
REACH Reg. No	01-2119487295-27-xxxx
CAS No	7704-34-9
EC No	231-722-6
Index No	016-094-00-1
Purity	99,9 %
Molecular formula	S
Molar mass	32,06 $^{g}/_{mol}$

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

Following skin contact

Rinse skin with water/shower.

Following eye contact

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart.

Following ingestion

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water, Foam, ABC-powder

Unsuitable extinguishing media

Water jet

5.2 Special hazards arising from the substance or mixture

Deposited combustible dust has considerable explosion potential.

Hazardous combustion products

Sulphur oxides (SOx)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapours/dust/spray/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains, Take up mechanically

Advice on how to clean up a spill

Take up mechanically.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations

- Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation. Take precautionary measures against static discharge. Use only in well-ventilated areas. Ground/bond container and receiving equipment.

- Specific notes/details

Dust deposits may accumulate on all deposition surfaces in a technical room.

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

- Explosive atmospheres

Removal of dust deposits.

- Ventilation requirements

Use local and general ventilation.

- Packaging compatibilities

Only packagings which are approved (e.g. acc. to ADR) may be used.

7.3 Specific end use(s)

See section 16 for a general overview.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [ppm]	Ceiling-C [mg/m³]	Notation	Source
DE	dust		AGW		1,25		2,5			Y, r	TRGS 900
DE	dust		AGW		10		20			Y, i	TRGS 900
DE	dust		MAK		0,3		2,4			r	DFG
DE	dust		MAK		4					i	DFG

Notation

Ceiling-C	ceiling value is a limit value above which exposure should not occur
i	inhalable fraction
r	respirable fraction
STEL	short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average (unless otherwise specified)
Y	a risk of developmental toxicity does not need to be expected if the occupational exposure limit value and the biological limit value (BGW) are adhered to

8.2 Exposure controls

Appropriate engineering controls

General ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection

Wear eye/face protection.

Skin protection

- Hand protection

Wear protective gloves.

- Other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

Respiratory protection

Particulate filter device (EN 143).

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	solid
Colour	yellow - yellow-orange
Odour	like sulphur - like rotten eggs
Melting point/freezing point	>118 – <120 °C at 101,3 kPa
Boiling point or initial boiling point and boiling range	445 °C
Flammability	this material is combustible, but will not ignite readily
Lower and upper explosion limit	not determined
Flash point	160 °C (DIN EN ISO 2719)
Auto-ignition temperature	not determined
Decomposition temperature	not relevant
pH (value)	not applicable
Kinematic viscosity	not relevant

Solubility(ies)

Water solubility	<0,005 $^{mg}/_{l}$ at 22 °C

Partition coefficient

Partition coefficient n-octanol/water (log value)	not relevant (inorganic)

Vapour pressure	0,13 kPa at 184 °C

Density and/or relative density

Density	1.800 – 2.070 $^{kg}/_{m^3}$ at 20 °C
Relative vapour density	information on this property is not available

Particle characteristics	no data available

9.2 Other information

Information with regard to physical hazard classes	hazard classes acc. to GHS (physical hazards): not relevant

Other safety characteristics

Solid content	100 %

SECTION 10: Stability and reactivity

10.1 Reactivity

Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials".

10.2 Chemical stability

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

No known hazardous reactions.

10.4 Conditions to avoid

There are no specific conditions known which have to be avoided.

10.5 Incompatible materials

There is no additional information.

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Classification according to GHS (1272/2008/EC, CLP)

Acute toxicity

Shall not be classified as acutely toxic.

GHS of the United Nations, annex 4: May be harmful if swallowed or in contact with skin.

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Shall not be classified as seriously damaging to the eye or eye irritant.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

11.2 Information on other hazards

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.
Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV): nwg, non-hazardous to water (Germany)

12.2 Persistence and degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Endocrine disrupting properties

Not listed.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Waste treatment-relevant information

Recycling/reclamation of other inorganic materials.

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used. Completely emptied packages can be recycled. Handle contaminated packages in the same way as the substance itself.

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

SECTION 14: Transport information

14.1 UN number or ID number

ADR/RID/ADN	UN 1350
IMDG-Code	UN 1350
ICAO-TI	UN 1350

14.2 UN proper shipping name

ADR/RID/ADN	SULPHUR
IMDG-Code	SULPHUR
ICAO-TI	Sulphur

14.3 Transport hazard class(es)

ADR/RID/ADN	4.1
IMDG-Code	4.1
ICAO-TI	4.1

14.4 Packing group

ADR/RID/ADN	III
IMDG-Code	III
ICAO-TI	III

14.5 Environmental hazards

non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

Information for each of the UN Model Regulations

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information

Classification code	F3
Danger label(s)	4.1

Special provisions (SP)	242
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 kg
Transport category (TC)	3
Tunnel restriction code (TRC)	E
Hazard identification No	40

International Maritime Dangerous Goods Code (IMDG) - Additional information

Marine pollutant	-
Danger label(s)	4.1

Special provisions (SP)	242, 967
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 kg
EmS	F-A, S-G
Stowage category	A

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Danger label(s)	4.1

Special provisions (SP)	A105
Excepted quantities (EQ)	E1
Limited quantities (LQ)	10 kg

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant provisions of the European Union (EU)

Restrictions according to REACH, Annex XVII

Dangerous substances with restrictions (REACH, Annex XVII)

Name of substance	Name acc. to inventory	CAS No	Restriction	No
sulfur	substances in tattoo inks and permanent make-up		R75	75

Legend

R75 1. Shall not be placed on the market in mixtures for use for tattooing purposes, and mixtures containing any such substances shall not be used for tattooing purposes, after 4 January 2022 if the substance or substances in question is or are present in the following circumstances:
(a) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as carcinogen category 1A, 1B or 2, or germ cell mutagen category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(b) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as reproductive toxicant category 1A, 1B or 2, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(c) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin sensitiser category 1, 1A or 1B, the substance is present in the mixture in a concentration equal to or greater than 0,001 % by weight;
(d) in the case of a substance classified in Part 3 of Annex VI to Regulation (EC) No 1272/2008 as skin corrosive category 1, 1A, 1B or 1C or skin irritant category 2, or as serious eye damage category 1 or eye irritant category 2, the substance is present in the mixture in a concentration equal to or greater than:
(i) 0,1 % by weight, if the substance is used solely as a pH regulator;
(ii) 0,01 % by weight, in all other cases;
(e) in the case of a substance listed in Annex II to Regulation (EC) No 1223/2009 (*1), the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight;
(f) in the case of a substance for which a condition of one or more of the following kinds is specified in column g (Product type, Body parts) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration equal to or greater than 0,00005 % by weight:
(i) “Rinse-off products”;
(ii) “Not to be used in products applied on mucous membranes”;
(iii) “Not to be used in eye products”;
(g) in the case of a substance for which a condition is specified in column h (Maximum concentration in ready for use preparation) or column i (Other) of the table in Annex IV to Regulation (EC) No 1223/2009, the substance is present in the mixture in a concentration, or in some other way, that does not accord with the condition specified in that column;
(h) in the case of a substance listed in Appendix 13 to this Annex, the substance is present in the mixture in a concentration equal to or greater than the concentration limit specified for that substance in that Appendix.
2. For the purposes of this entry use of a mixture “for tattooing purposes” means injection or introduction of the mixture into a person’s skin, mucous membrane or eyeball, by any process or procedure (including procedures commonly referred to as permanent make-up, cosmetic tattooing, micro-blading and micro-pigmentation), with the aim of making a mark or design on his or her body.
3. If a substance not listed in Appendix 13 falls within more than one of points (a) to (g) of paragraph 1, the strictest concentration limit laid down in the points in question shall apply to that substance. If a substance listed in Appendix 13 also falls within one or more of points (a) to (g) of paragraph 1, the concentration limit laid down in point (h) of paragraph 1 shall apply to that substance.
4. By way of derogation, paragraph 1 shall not apply to the following substances until 4 January 2023:
(a) Pigment Blue 15:3 (CI 74160, EC No 205-685-1, CAS No 147-14-8);
(b) Pigment Green 7 (CI 74260, EC No 215-524-7, CAS No 1328-53-6).
5. If Part 3 of Annex VI to Regulation (EC) No 1272/2008 is amended after 4 January 2021 to classify or re-classify a substance such that the substance then becomes caught by point (a), (b), (c) or (d) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the date of application of that new or revised classification is after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect on the date of application of that new or revised classification.
6. If Annex II or Annex IV to Regulation (EC) No 1223/2009 is amended after 4 January 2021 to list or change the listing of a substance such that the substance then becomes caught by point (e), (f) or (g) of paragraph 1 of this entry, or such that it then falls within a different one of those points from the one within which it fell previously, and the amendment takes effect after the date referred to in paragraph 1 or, as the case may be, paragraph 4 of this entry, that amendment shall, for the purposes of applying this entry to that substance, be treated as taking effect from the date falling 18 months after entry into force of the act by which that amendment was made.
7. Suppliers placing a mixture on the market for use for tattooing purposes shall ensure that, after 4 January 2022, the mixture is marked with the following information:
(a) the statement “Mixture for use in tattoos or permanent make-up”;
(b) a reference number to uniquely identify the batch;
(c) the list of ingredients in accordance with the nomenclature established in the glossary of common ingredient names pursuant to Article 33 of Regulation (EC) No 1223/2009, or in the absence of a common ingredient name, the IUPAC name. In the absence of a common ingredient name or IUPAC name, the CAS and EC number. Ingredients shall be listed in descending order by weight or volume of the ingredients at the time of formulation. “Ingredient” means any substance added during the process of formulation and present in the mixture for use for tattooing purposes. Impurities shall not be regarded as ingredi-

Legend

ents. If the name of a substance, used as ingredient within the meaning of this entry, is already required to be stated on the label in accordance with Regulation (EC) No 1272/2008, that ingredient does not need to be marked in accordance with this Regulation;
(d) the additional statement “pH regulator” for substances falling under point (d)(i) of paragraph 1;
(e) the statement "Contains nickel. Can cause allergic reactions." if the mixture contains nickel below the concentration limit specified in Appendix 13;
(f) the statement "Contains chromium (VI). Can cause allergic reactions." if the mixture contains chromium (VI) below the concentration limit specified in Appendix 13;
(g) safety instructions for use insofar as they are not already required to be stated on the label by Regulation (EC) No 1272/2008.
The information shall be clearly visible, easily legible and marked in a way that is indelible.
The information shall be written in the official language(s) of the Member State(s) where the mixture is placed on the market, unless the Member State(s) concerned provide(s) otherwise.
Where necessary because of the size of the package, the information listed in the first subparagraph, except for point (a), shall be included instead in the instructions for use.
Before using a mixture for tattooing purposes, the person using the mixture shall provide the person undergoing the procedure with the information marked on the package or included in the instructions for use pursuant to this paragraph.
8. Mixtures that do not contain the statement “Mixture for use in tattoos or permanent make-up” shall not be used for tattooing purposes.
9. This entry does not apply to substances that are gases at temperature of 20 °C and pressure of 101,3 kPa, or generate a vapour pressure of more than 300 kPa at temperature of 50 °C, with the exception of formaldehyde (CAS No 50-00-0, EC No 200-001-8).
10. This entry does not apply to the placing on the market of a mixture for use for tattooing purposes, or to the use of a mixture for tattooing purposes, when placed on the market exclusively as a medical device or an accessory to a medical device, within the meaning of Regulation (EU) 2017/745, or when used exclusively as a medical device or an accessory to a medical device, within the same meaning. Where the placing on the market or use may not be exclusively as a medical device or an accessory to a medical device, the requirements of Regulation (EU) 2017/745 and of this Regulation shall apply cumulatively.

List of substances subject to authorisation (REACH, Annex XIV) / SVHC - candidate list

not listed

Deco-Paint Directive

VOC content	0 %

Industrial Emissions Directive (IED)

VOC content	0 %

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

not listed

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

not listed

Water Framework Directive (WFD)

not listed

Regulation on persistent organic pollutants (POP)

Not listed.

National regulations (Germany)

Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV)

Wassergefährdungsklasse, WGK (water hazard class)	nwg	non-hazardous to water
Index number	842	

Technical instructions on air quality control (Germany)

Number	Group of substances	Class	Conc.	Mass flow	Mass concentration	Notation
5.2.1	total dust, including micro-dust		≥ 25 wt%	0,2 $^{kg}/_{h}$	20 $^{mg}/_{m^3}$	2)

Notation
2) even with a mass flow smaller than or equal to 0.20 kg/h, a mass concentration of 0.15 g/m³ in waste gas may not be exceeded

Storage of hazardous substances in non-stationary containers (TRGS 510) (Germany)

Storage class (LGK) 4.1 B (flammable and desensitizing explosive solids)

National inventories

Country	Inventory	Status
EU	REACH Reg.	substance is listed

Legend
REACH Reg. REACH registered substances

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.2		- Precautionary statements: change in the listing (table)	yes
12.1	Toxicity: Acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment. Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV): WGK 1, slightly hazardous to water (Germany)	Toxicity: Acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment. Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen (Ordinance on facilities for handling substances hazardous to water) (AwSV): nwg, non-hazardous to water (Germany)	yes
15.1	Wassergefährdungsklasse, WGK (water hazard class): 1 slightly hazardous to water	Wassergefährdungsklasse, WGK (water hazard class): nwg non-hazardous to water	yes
15.1	Index number: 753	Index number: 842	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
ADR/RID/ADN	Agreements concerning the International Carriage of Dangerous Goods by Road/Rail/Inland Waterways (ADR/RID/ADN)

Abbr.	Descriptions of used abbreviations
AGW	Workplace exposure limit
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DFG	Deutsche Forschungsgemeinschaft MAK-und BAT-Werte-Liste, Senatskommission zur Prüfung gesundheitsschädlicher Arbeitsstoffe, Wiley-VCH, Weinheim
DGR	Dangerous Goods Regulations (see IATA/DGR)
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
LGK	Lagerklasse (storage class according to TRGS 510, Germany)
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	Short-term exposure limit
SVHC	Substance of Very High Concern
TRGS	Technische Regeln für Gefahrstoffe (technical rules for hazardous substances, Germany)
TRGS 900	Arbeitsplatzgrenzwerte (TRGS 900)
TWA	Time-weighted average
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. Regulation (EC) No. 1907/2006 (REACH), amended by 2020/878/EU.

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H315	Causes skin irritation.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Version number: GHS 1.0 Issue date: 24.01.2022

Exposure Scenario / ES No 1

1 TITLE SECTION

Exposure Scenario name: Manufacture of substance

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC1: Manufacture of the substance.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 1.1.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Manufacture of substance or use as process chemical or extracting agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.

Product characteristics	
Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Bulk product storage: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Exposure Scenario / ES No 2

1 TITLE SECTION

Exposure Scenario name: Distribution of substance

Sectors of use [SU]

SU3: Industrial uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC15: Use as laboratory reagent.

Environmental release categories [ERC]

ERC1: Manufacture of the substance.
ERC2: Formulation into mixture.
ERC3: Formulation into solid matrix.
ERC3: Formulation in materials.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).
ERC5: Industrial use resulting in inclusion into or onto a matrix.
ERC5: Use at industrial site leading to inclusion into/onto article.
ERC6a: Use of intermediate.
ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article).
ERC6b: Industrial use of reactive processing aids.
ERC6c: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article).
ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article).
ERC7: Use of functional fluid at industrial site.
ERC7: Industrial use of substances in closed systems.

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 1.1b.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Bulk product storage: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Exposure Scenario / ES No 3

1 TITLE SECTION

Exposure Scenario name: Formulation & (re)packing of substances and mixtures

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC5: Mixing or blending in batch processes.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.
PROC15: Use as laboratory reagent.
PROC23: Open processing and transfer operations at substantially elevated temperature.
PROC24: High (mechanical) energy work-up of substances bound in/on materials and/or articles.

Environmental release categories [ERC]

ERC2: Formulation into mixture.

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 2.2.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Bulk loading (including marine vessel/barge, rail/road car and IBC loading) of substance within closed or contained systems, including incidental exposures during its sampling, storage, unloading, maintenance and associated laboratory activities.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Bulk product storage: No other specific measures identified Mixing operations (open systems) No other specific measures identified Milling, grinding and similar activities No other specific measures identified Small package filling No other specific measures identified Pelletising No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Version number: GHS 1.0 Issue date: 24.01.2022

Exposure Scenario / ES No 4

1 TITLE SECTION

Exposure Scenario name: Use as an intermediate

Sectors of use [SU]

SU3: Industrial uses.
SU8: Manufacture of bulk, large scale chemicals (including petroleum products).
SU9: Manufacture of fine chemicals.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC15: Use as laboratory reagent.
PROC22: Manufacturing and processing of minerals and/or metals at substantially elevated temperature.
PROC23: Open processing and transfer operations at substantially elevated temperature.

Environmental release categories [ERC]

ERC6a: Use of intermediate.

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 6.1a.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).

Product characteristics	
Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Bulk product storage: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Exposure Scenario / ES No 5

1 TITLE SECTION

Exposure Scenario name: Use as binders and release agents

Sectors of use [SU]

SU3: Industrial uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC6: Calendering operations.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC10: Roller application or brushing.
PROC13 Treatment of articles by dipping and pouring.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.

Environmental release categories [ERC]

ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 4.10a.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Covers the use as binders and release agents including material transfers, mixing, application (including spraying and brushing), mould forming and casting and handling of waste.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable

Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Bulk product storage: No other specific measures identified Mixing operations (open systems): No other specific measures identified Roller, spreader, flow application: No other specific measures identified Dipping, immersion and pouring: No other specific measures identified Article formation in mould: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Version number: GHS 1.0 Issue date: 24.01.2022

Exposure Scenario / ES No 6

1 TITLE SECTION

Exposure Scenario name: Explosives manufacture & use

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC5: Mixing or blending in batch processes.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.

Environmental release categories [ERC]

ERC8e: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor).

Specific Environmental Release Categories [SPERC]

not applicable

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Covers exposures arising from the manufacture and use of slurry explosives (including materials transfer, mixing and charging) and equipment cleaning.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)

Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Mixing operations (open systems): No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Version number: GHS 1.0 Issue date: 24.01.2022

Exposure Scenario / ES No 7

1 TITLE SECTION

Exposure Scenario name: Use as binders and release agents

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC6: Calendering operations.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC10: Roller application or brushing.
PROC13 Treatment of articles by dipping and pouring.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems.
ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).
ERC8d: Wide dispersive outdoor use of processing aids in open systems.

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 8.10b.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Covers the use as binders and release agents including material transfers, mixing, application by spraying, brushing, and handling of waste.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Bulk product storage: No other specific measures identified Mixing operations (open systems): No other specific measures identified Roller, spreader, flow application: No other specific measures identified Dipping, immersion and pouring: No other specific measures identified Article formation in mould: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Version number: GHS 1.0 Issue date: 24.01.2022

Exposure Scenario / ES No 8

1 TITLE SECTION

Exposure Scenario name: Use as binders and release agents

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC10: Roller application or brushing.
PROC11: Non industrial spraying.
PROC13 Treatment of articles by dipping and pouring.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.

Environmental release categories [ERC]

ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).
ERC8d: Wide dispersive outdoor use of processing aids in open systems.
ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix.

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 8.15.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Application of surface coatings and binders in road and construction activities, including paving uses, manual mastic and in the application of roofing and water-proofing membranes.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)

Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop Other skin protection measures such as impervious suits and face shields may be required during high dispersion activities which are likely to lead to substantial aerosol release, e.g. spraying Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Roller, spreader, flow application: No other specific measures identified Dipping, immersion and pouring: No other specific measures identified Spraying: No other specific measures identified Roller, spreader, flow application: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values. Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Exposure Scenario / ES No 9

1 TITLE SECTION

Exposure Scenario name: Rubber production and processing

Sectors of use [SU]

SU3: Industrial uses.
SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys).
SU11: Manufacture of rubber products.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.
PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.
PROC4: Chemical production where opportunity for exposure arises.
PROC5: Mixing or blending in batch processes.
PROC6: Calendering operations.
PROC7: Industrial spraying.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing).
PROC13 Treatment of articles by dipping and pouring.
PROC14: Tabletting, compression, extrusion, pelletisation, granulation.
PROC15: Use as laboratory reagent.
PROC21: Low energy manipulation of substances bound in materials and/or articles.

Environmental release categories [ERC]

ERC1: Manufacture of the substance.
ERC4: Use of non-reactive processing aid at industrial site (no inclusion into or onto article).
ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article).

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 4.19.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)
Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented

Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified Process sampling: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified Bulk product storage: No other specific measures identified Mixing operations (open systems): No other specific measures identified Dipping, immersion and pouring: No other specific measures identified Calendering (including Banburys) Vulcanisation Cooling cured articles: No other specific measures identified Spraying: No other specific measures identified Small scale weighing: No other specific measures identified Pressing uncured rubber blanks: No other specific measures identified Finishing operations: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Annex to the extended Safety Data Sheet (eSDS)

Sulfur

Version number: GHS 1.0 Issue date: 24.01.2022

Exposure Scenario / ES No 10

1 TITLE SECTION

Exposure Scenario name: Use in agrochemicals

Sectors of use [SU]

SU22: Professional uses.

Process categories [PROC]

PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.
PROC4: Chemical production where opportunity for exposure arises.
PROC8a: Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.
PROC8b: Transfer of substance or mixture (charging and discharging) at dedicated facilities.
PROC11: Non industrial spraying.
PROC13 Treatment of articles by dipping and pouring.

Environmental release categories [ERC]

ERC8a: Wide dispersive indoor use of processing aids in open systems.
ERC8d: Widespread use of non-reactive processing aid (no inclusion into or onto article, outdoor).
ERC8d: Wide dispersive outdoor use of processing aids in open systems.

Specific Environmental Release Categories [SPERC]

ESVOC SPERC 8.11a.v1

2 Operational conditions and risk management measures

2.1 Control of environmental exposure

Not applicable.

Product characteristics	"mono-constituent" substance
Physical form of product	Solid at STP, liquid at elevated operating temperature, vapour pressure < 0.5 kPa

2 Conditions of use affecting exposure - Workers

2.2 Control of worker exposure

Contributing scenario name (workers)

Manufacture of tyres and general rubber articles, including processing of raw (uncured) rubber, handling and mixing of rubber additives, vulcanising, cooling and finishing.

Product characteristics

Vapour pressure	Vapour pressure > 10 kPa at STP 0,13 kPa at 184 °C
Concentration of substance in product	Covers percentage substance in the product up to 100 % (unless stated differently).
Amounts used	not applicable
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently)

Other given operational conditions affecting workers exposure	Assumes use at not more than 20 °C above ambient temperature, unless stated differently Assumes a good basic standard of occupational hygiene is implemented
Contributing Scenarios: Operational conditions and risk management measures	General measures (skin irritants): Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop Other protection measures such as segregation of activity, minimisation of personnel, respiratory protection, impervious suits and face shields should also be considered for high dispersion activities which are likely to lead to substantial aerosol or vapour release, e.g. spraying General exposures (closed systems): No other specific measures identified General exposures (closed systems) with sample collection: No other specific measures identified General exposures (closed systems) Batch process with sample collection: No other specific measures identified General exposures (open systems): No other specific measures identified Laboratory activities: No other specific measures identified Bulk transfers Dedicated facility: No other specific measures identified Equipment cleaning and maintenance: No other specific measures identified General exposures (open systems) No other specific measures identified Dipping, immersion and pouring: No other specific measures identified Spraying: No other specific measures identified

3 Exposure estimation and reference to its source

Exposure assessment (environment)	not applicable
Exposure assessment (human)	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
Exposure estimation	not applicable

4 Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environment

Not applicable.

Health

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Risk Management Measures are based on qualitative risk characterisation.
Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.
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